

DP-300006con

## POWER GENERATION SYSTEM AND METHOD

## ABSTRACT OF THE DISCLOSURE

An extended rich mode engine configured and operated extremely rich of stoichiometric to produce a substantially continuous hydrogen rich engine exhaust. Oxygen enrichment devices further optimize production of hydrogen rich engine exhaust. Engines include a free piston gas generator with rich homogenous charge compression, a rich internal combustion engine cylinder system with an oxygen generator, and a rich inlet turbo-generator system with exhaust heat recovery. Oxygen enrichment devices to enhance production of hydrogen rich engine exhaust include pressure swing absorption with oxygen selective materials, and oxygen separators such as an SOFC oxygen separator and a ceramic membrane oxygen separator.